Dr. Franz's photographs. This one may conjecture to have been due to the brightness of its surroundings.

The comparison reveals a systematic difference of ·0002 in the ordinates, but is consistent with the supposition that the differences in the abscissæ are accidental.

This difference in the ordinates is slightly increased when the comparison is made between Dr. Franz's positions and my telescopic positions only, whilst it would have practically disappeared from the photographic measures had I adopted the ordinate of the centre derived in § 5 from the photographic measures of the six points measured with the heliometer by Dr. Franz.

The result therefore justifies my rejection of these photographic measures so far as the abscissa of the centre is concerned, but gives reason for suspecting a real systematic difference of about 0″·2 in the ordinates between Dr. Franz's positions found with the heliometer and mine found with the filar micrometer.

The mean geocentric distance between the positions of the same point, as found by Dr. Franz and myself, is 0″·39, or less than one-thirteenth of the corresponding mean distance between positions found by Lohrmann and Mädler. There was also a systematic difference of a different kind between the ordinates found by these observers about fifteen times as great as that between Dr. Franz and myself, Lohrmann placing his points further from the equator than Mädler.

That small systematic differences should appear is not surprising. Dr. Franz calls attention to their existence between different parts of his own work, and I have already noted the same feature with regard to my work in the *Fifth Report of the Lunar Section of the British Astronomical Association.*

It says much for the general accuracy of the method that both these and the accidental differences should be as small as they are; and it is a great gratification to me to find my own work in such close agreement with that of one who has, I believe, given more attention to selenographic measurements than any other living astronomer, and to whom we owe the best determinations both of the physical libration and of the figure of the Moon.

Recent Observations of the Position of Nova Aurigæ with the 40-inch Telescope of the Yerkes Observatory. By E. E. Barnard.

Shortly after the announcement of Dr. Anderson's discovery of *Nova Aurigæ* in 1892 February Mr. Burnham made a careful set of measures of its position with reference to some thirteen stars near it.

The results of this work are given by him in a paper in

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Monthly Notices for 1892 April. In the same publication for 1892 December he gives his observations of the brightness of the *Nova* as it slowly faded out. These observations were made with the 36-inch equatorial of the Lick Observatory. From March 13 of that year, when his determinations of magnitude began, until April 26, when proximity to the Sun prevented further work, the star had diminished from the 8th to the 16th magnitude. In Mr. Burnham's opinion it could not have been seen with the 36-inch for more than one week longer even had the star been favourably placed for observation. After March 13 the decrease in light was essentially uniform at the rate of 0·18 magnitude a day.

In August of the same year the star had brightened up again to between the 10th and 11th magnitudes, and had undergone a remarkable physical change, as shown by both visual and spectroscopic observations, indicating that the *Nova* then possessed the characteristics of a planetary nebula.

This star has faded considerably in the past few years, and is now of about the 13th magnitude.

In *Astronomische Nachrichten*, 3143, 3238, and 3279, I have given micrometer measures of the *Nova* with respect to two of Mr. Burnham's comparison stars, E and F of his diagram in *Monthly Notices* for 1892 April. These measures showed that in the two years during which the star was under observation no appreciable change occurred in its position, there being no evidence of parallax or proper motion, implying an enormous distance from the Earth.

My own measures were also in close agreement with those of Mr. Burnham.

The *Nova* has been examined a few times with the 40-inch, and I have in the past winter secured some further measures of its position with the large telescope. These show that no change has occurred in its place in the past eight years.

Mr. Newall has questioned the nebulous condition of the star, though the spectroscope has shown that it has the spectrum of a planetary nebula.

At the second appearance in 1892, when it had brightened up from the 16th, in May, to the 10th or 11th magnitude in August, it was found to have undergone a change both in appearance and in its spectrum. It had become bluish-white in colour, though in the earlier stages of its first appearance it was yellowish, and had seemed to grow redder as it diminished in brightness. It had also the appearance of a nebulous star.

In the present observations with the 40-inch the star was much fainter than at the measures with the 36-inch. On 1900 November 3 a direct estimation made it of the $13\frac{1}{2}$ magnitude, while from a comparison with the stars near it, whose magnitudes had been determined by Mr. Burnham, I found it to be of the 13·0 magnitude on Burnham's scale of magnitudes. On this date a determination of the difference of focus between the *Nova*

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and the star F made the focus of the former 0·3 inch further out than for F. It was not as well defined as the stars.

During these observations the position of the *Nova* was again measured with reference to E and F on some five nights. The results are given as follows :—

Positions of Nova Aurigæ in 1900.

A and F.

Nov.	3	1900·842	32°·46	84″·96
	5	·847	32·52	...
	22	·894	32·73	84·87
	26	·905	32·64	84·93
Dec.	8	·937	32·75	85·09
		1900·885	32·62	84·96

A and E.

Nov.	3	1900·842	323°·28	74″·49
	5	·847	323·04	...
	22	·894	323·34	74·35
	26	·905	323·16	74·63
Dec.	8	·937	323·22	74·59
		1900·885	323·21	74·51

On November 5 clouds prevented distance measures. November 22 the measures were hurriedly made.

Following are the means of the different seasons' measures of the *Nova* and these two stars. Those of 1892, 1893, and 1894 were made with the 36-inch of the Lick Observatory. Those of 1900 were made with the 40-inch of this observatory.

Means for each Season of Observation.

A and E (E = 12^m).

1892·9	323°·38	74″·58	16 nights.
1893·9	323·43	74·51	14 „
1894·9	323·41	74·66	3 „
1900·9	323·21	74·51	5 and 4 „
1895·6	323·377	74·543	Weighting by number of nights

A and F (F = 10·5^m).

1892·9	32°·63	84″·94	18 nights.
1893·9	32·89	84·91	8 „
1894·9	32·63	84·94	3 „
1900·9	32·62	84·96	5 and 4 „
1895·6	32·675	84·927	Weighting by number of nights.

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If now we compare the means for each year with the means of all the measures of the different years, we shall have the following:

Yearly Means Compared with the Means of all the Measures.

	A and F.			A and E.	
1892	+0°·045	−0″·009	1892	−0°·003	−0″·037
1893	−0·145	+0·038	1893	−0·053	+0·037
1894	+0·045	−0·013	1894	−0·033	−0·114
1900	+0·055	−0·036	1900	+0·167	+0·031

These are in satisfactory agreement and show no certain change in the position of the *Nova*. They also show, as has been found in other measures, especially in those of the fifth satellite of *Jupiter*, that the same observer using the 36-inch of the Lick Observatory and the 40-inch of the Yerkes Observatory experiences no personality due to the different instruments, the measures made with one instrument being in perfect harmony with those made with the other.

The measures made by Mr. Burnham and given in *Monthly Notices* for 1892 April are, after correcting an error in the mean for the distance AE from 74·24 to 74″·32:

Mr. Burnham's Measures of the Nova.

	A and E.		
1892·14	323° 60	74″·32	3 nights.

	A and F.		
1892·12	32°·38	85″·05	4 nights.

These give the following differences from my observations:

A and E.		A and F.	
−0°·22	+0″·22	+0°·29	−0″·12

These are, considering the faintness of the objects and the distances measured, in as close agreement as would be expected from different observers. It is evident that further measures of this object for many years to come would be useless.

In looking up references to *Nova Aurigæ* the following corrections have been noted.

In *Astronomische Nachrichten* 3238, p. 391, F. Renz gives some measures of these objects. His comparison stars were E and F. In his measures the star F is put in the wrong quadrant with reference to the *Nova*, the position angle being given 212. It should be 32°.

In *Monthly Notices* for 1892 April the scale given at the bottom of Mr. Burnham's diagram is wrong. On this scale

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the figures read 0″, 40″, 80″. To correspond with the diagram they should be 0″, 80″, 160″. In the same paper, at p. 436, a reference is made to *Astronomische Nachrichten* 3070: this is a typographical error for 3076.

Yerkes Observatory, Williams Bay, Wisconsin:
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Further Observations of Nova Aurigæ in 1901.

By E. E. Barnard.

Nova Aurigæ has been observed on two nights this year, and on each occasion its light was estimated in terms of the comparison stars used by Mr. Burnham in 1892. The comparisons were made with the stars B, E, *e*, G, H and J.

The result from all these made the *Nova* 12·7 magnitude on this scale.

Direct estimates on the two dates made the magnitude 13·0 and 12·9 respectively.

I also made independent estimates of the magnitudes of the comparison stars. They are:

	B	C	E	*e*	F	G	H	J	M	*m*
Oct. 21	13·5	15·0	11·8	13·2	10·0	11·7	12·0	12·0	12·0	12·0
22	—	15·0	12·1	14·0	10·0	12·0	12·3	12·4	12·5	—
	13·5	15·0	11·9	13·7	10·0	11·8	12·1	12·2	12·2	12·0

Of these stars Mr. Burnham has given the following magnitudes:

B 14·8 C 15·2 E 11·7 *e* 13·2 F 10·4 G 11·5 H 11·8 J 12·7
M 13·2 *m* 13·8.

His estimate of the brightness of B was doubtless influenced by the proximity of the greater brightness of the *Nova* in the spring of 1892.

In my estimates of the magnitudes of M and *m* no note was made for their relative brightness. My recollection is that M was somewhat the brighter of the two.

Under the best conditions the *Nova* has not appeared well-defined when in the best focus. There is a slight haziness about it suggestive of a slightly nebulous star.

1901 *October* 29.